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None

(58) Field of search

A1B

**Selected US specifications from IPC sub-class
E02B**

(54) **Drainage assembly**

(57) A drainage assembly to be laid in a trench in soggy ground comprises at least two elongate drainage units (10) arranged in longitudinal disposition relative to each other with each two adjacent units being butt jointed and held together by a sleeve. Each drainage unit (10) has an upper plate (14) and a lower plate (16) between which is sandwiched an assemblage (18) of lightweight discrete elements with a passage (20) to convey the water away, the passage being defined longitudinally through the discrete elements.

The discrete elements are adhered to each other at their points of contact leaving openings through which water can drain into the passage (20).

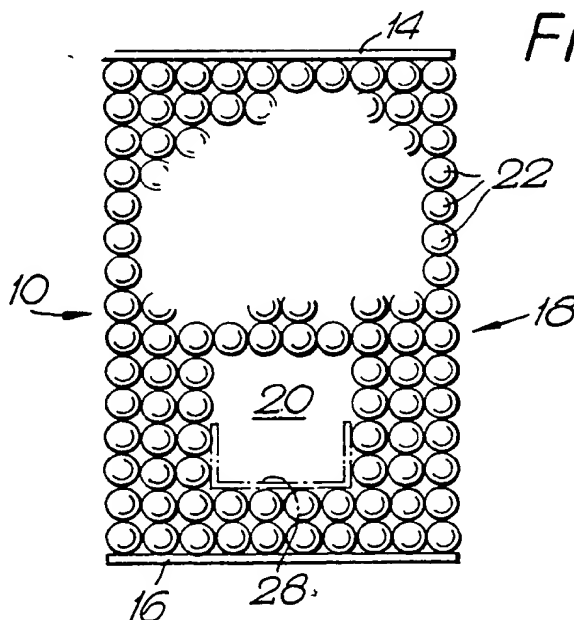


Fig. 1.

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Fig. 1.

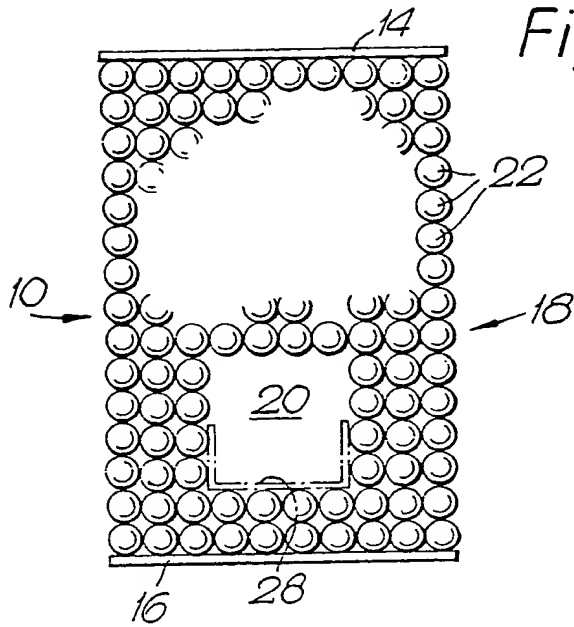


Fig. 2.

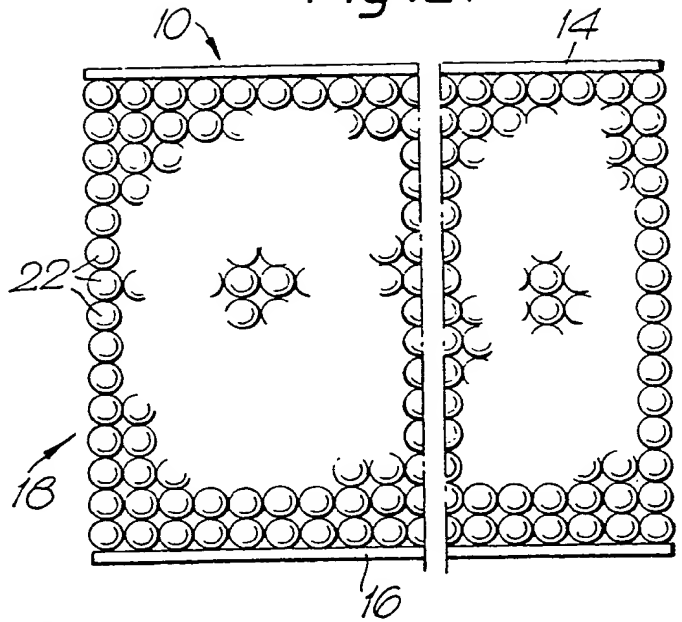
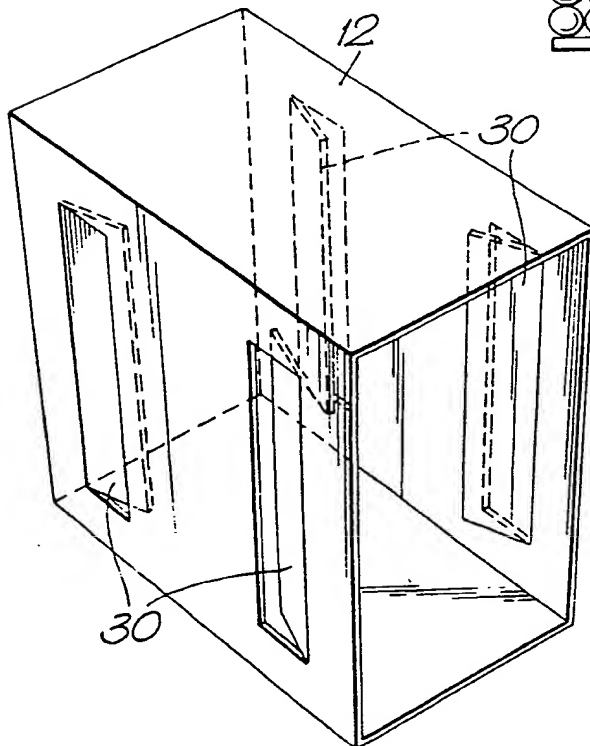
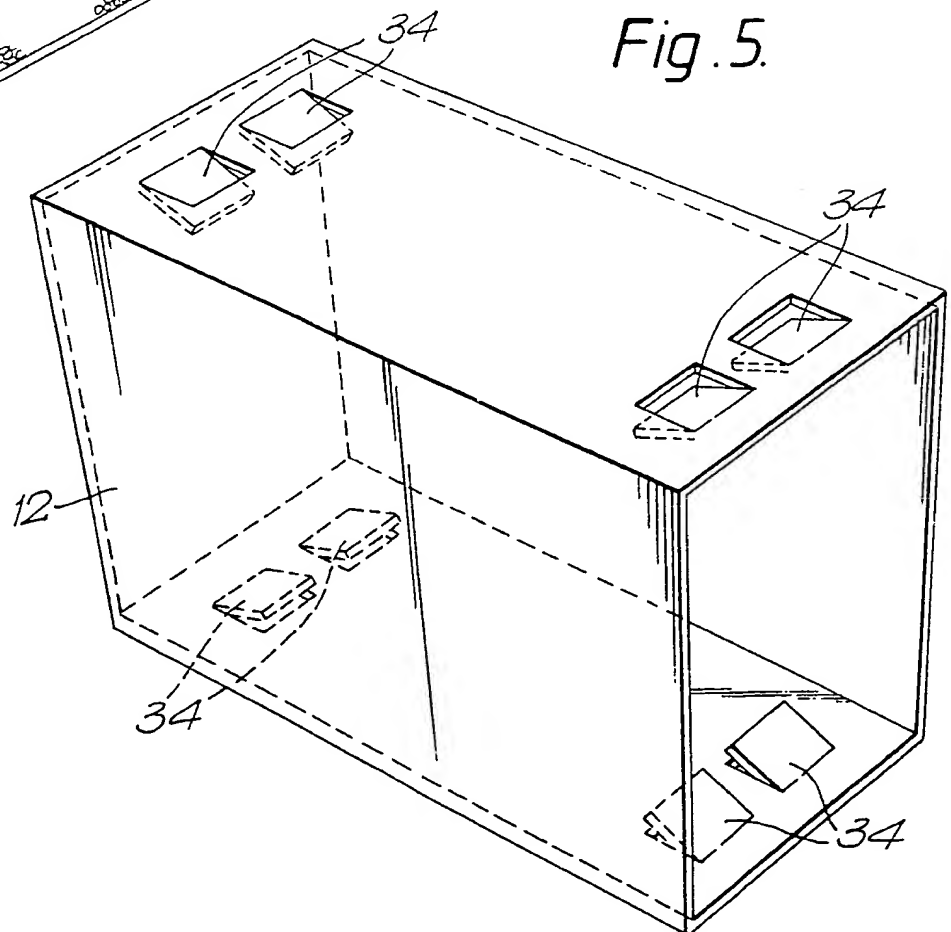
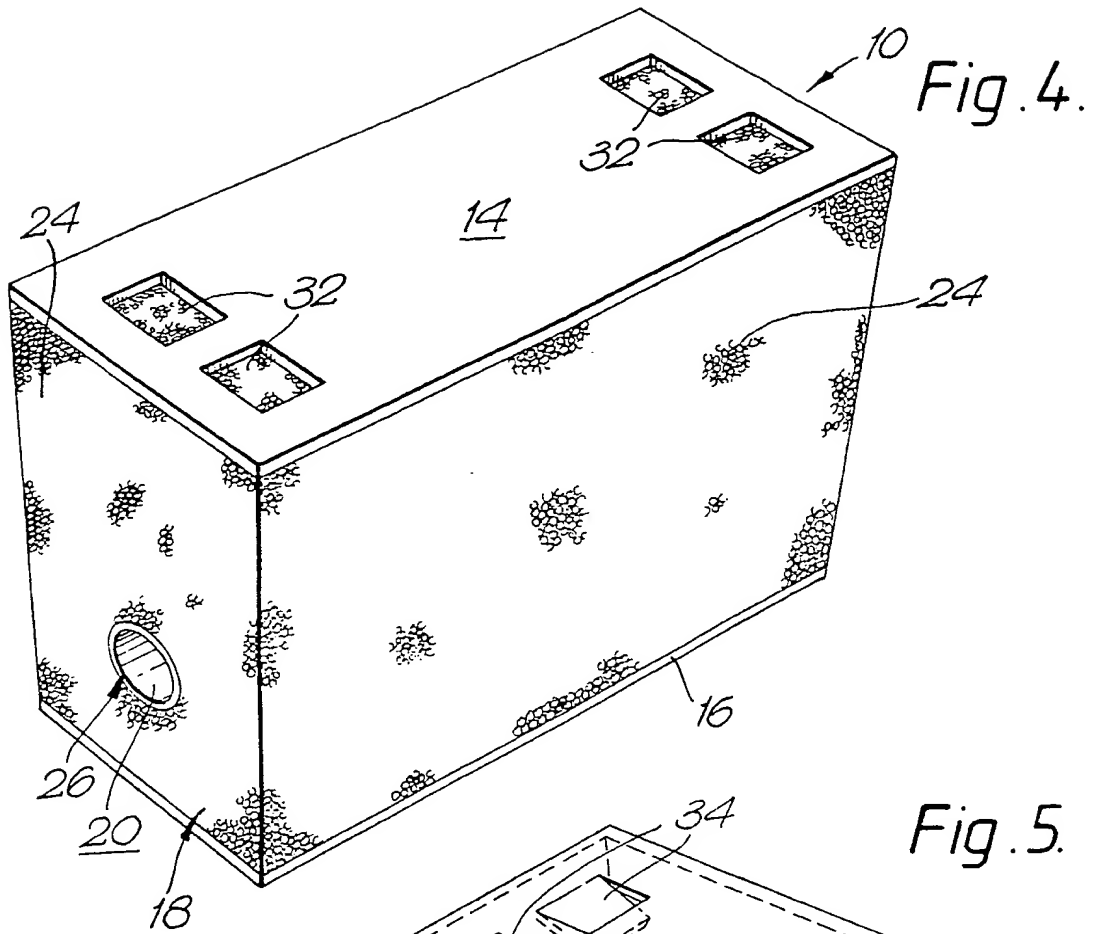


Fig. 3.





DRAINAGE ASSEMBLY.

05 This invention relates to a drainage assembly primarily, but not exclusively, for use in boglands or other water-saturated areas over which it is difficult to transport heavy materials used in the construction of conventional drainage systems.

10 Accordingly, the present invention is a drainage assembly comprising at least two elongate drainage units arranged in longitudinal disposition relative to each other with each two adjacent units being butt jointed and held together by a sleeve, each drainage unit having an upper plate and a lower plate between which is formed an assemblage of lightweight discrete elements with a passage defined longitudinally therethrough.

15 Preferably, the discrete elements are adhered to each other at their points of contact leaving openings through which water can drain into the passage.

20 Preferably also, the discrete elements are hollow spheres. The passage through the hollow spheres is preferably formed during the creation of the assemblage by a mould subsequently removed.

25 Alternatively, the discrete elements are expanded beads of plastics material, for example polystyrene. The passage through the expanded beads is created by a pipe whose wall is apertured by perforations or slits to

allow water passing through the expanded beads to flow into the pipe to be conducted away.

05 Preferably further, the sleeve and the outer ends of the drainage units are provided with co-operating male and female clip means.

The longitudinal walls of each drainage unit may preferably be covered with a net of fine stocking mesh. The cross-section of each drainage unit may preferably be of shape to complement the cross-sectional area
10 eg. of rectangular or trapeziform shape of a drainage trench.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

15 Fig. 1 is an end view of a drainage unit according to a first embodiment of the present invention;

Fig. 2 is a side view of the drainage unit;

Fig. 3 is a perspective view of a sleeve used to join two abutting drainage units of the first
20 embodiment;

Fig. 4 is a perspective view from the end, side and above of a drainage unit according to a second embodiment; and

Fig. 5 is perspective view of a sleeve used to join two abutting drainage units of the second
25 embodiment.

Referring to the drawings, a drainage assembly comprises a plurality of two elongate drainage units 10 arranged in longitudinal disposition relative to each other with each two adjacent units 10 being butt jointed
05 and held together by a sleeve 12.

Each drainage unit 10 has an upper plate 14 and a lower plate 16, both of plastics material, and between which is sandwiched an assemblage 18 of lightweight discrete elements with a passage 20 defined
10 longitudinally therethrough.

During manufacture, the discrete elements are coated with an adhesive to allow them to adhere to each other at their points of contact leaving openings through which water can drain into the passage 20.

15 The sleeve 12 and the outer ends of the drainage units 10 are provided with co-operating male and female clip means.

In the first embodiment as shown in Figs. 1,2 and 3, the discrete elements are hollow spheres 22 of
20 plastics material. The passage 20 through the hollow spheres 22 is formed during the creation of the assemblage 18 by a mould (not shown) which is subsequently removed. A shallow trough 28 shown in broken line can be provided to fit into the passage 20
25 along its bottom and partially up each side.

In the second embodiment as shown in Figs. 4 and 5, the discrete elements are expanded beads 24 of

plastics material, for example polystyrene. The passage
20 through the expanded beads 24 is created by a pipe 26
whose wall is apertured by perforations or slits to
allow water passing through the expanded beads 24 to
05 flow into the pipe 26 to be conducted away.

The male and female clip means for the drainage
units and sleeves of the first embodiment are as shown
in Figs. 1 to 3. The male clips are on the lateral walls
of sleeve 12 and are four identical flaps 30 being
10 formed from the lateral walls and bent inwardly. The
sleeves 12 are of plastics material and the flaps 30
have an inherent resilient property. Each sleeve 12 is
pushed onto an end of the drainage unit 10 so that the
outer sides of the flaps 30 engage in the female clips
15 which are upright elongate recesses formed between
vertical rows of the hollow spheres, the flaps 30
bending as the sleeve is pushed past each upright row of
hollow spheres until the sleeve 12 is correctly
positioned.

20 The male and female clip means for the drainage
units and sleeves of the second embodiment are as shown
in Figs. 4 and 5. The female clips are provided in the
upper and lower plates 14, 16 as shown in Fig. 4 and are
rectangular cut-outs 32. The male clips are provided on
25 the upper and lower walls of sleeve 12 and are four
identical flaps 34 formed from in the upper and lower

walls and bent inwardly. The sleeves 12 are of plastics material and the flaps 34 have an inherent resilient property. Each sleeve 12 is pushed onto an end of the drainage unit 10 so that the outer sides of the flaps 34
05 engage in the cut-outs 30, the flaps 34 bending as the sleeve is pushed onto the plates until the sleeve 12 is correctly positioned and enters the cut-outs 32.

The longitudinal walls of each drainage unit 10 of either embodiment can be covered with a net (not
10 shown) of fine stocking mesh. For example, when the drainage unit is being formed in a mould, a tubular net can be used into which the upper and lower plates 14, 16 are positioned as is an element to form the passage, and the discrete elements can then be blown into the void
15 within the net. The net is provided to filter the water entering into the respective drainage unit in use to prevent the openings in the unit being clogged up with earth/silt carried in the water.

The cross-section of each drainage unit 10 is of a
20 shape to complement the cross-sectional area eg. of rectangular or trapeziform shape of a drainage trench into which the drainage units 10 are to be laid to form the assembly.

The drainage units 10 may be of any desired
25 length.

The above described invention is advantageous for use in creating a drainage system in soggy ground due to

its lightness and also due to the fact that it replaces both pipes and discrete stone material normally used heretofore above the pipes as an initial backfill which is topped by a soil backfill. Therefore in using the drainage assembly of the present invention, a trench is
05 dug and drainage units 10 are laid therein being connected together by sleeves 12. Thereafter only soil backfill is required to bring the level up to ground level. With the requirement of transporting heavy stone backfill across the soggy land to the trench removed,
10 the drainage system can be installed in a relatively shorter time than heretofore and the soggy land is not churned up to the same extent.

Variations and modifications can be made without departing from the scope of the invention.

CLAIMS

05

1. A drainage assembly comprising at least two elongate drainage units arranged in longitudinal disposition relative to each other with each two adjacent units being butt jointed and held together by a sleeve, each drainage unit having an upper plate and a lower plate between which is formed an assemblage of lightweight discrete elements with a passage defined longitudinally therethrough.

2. An assembly as claimed in Claim 1, wherein the discrete elements are adhered to each other at their points of contact leaving openings through which water can drain into the passage.

3. An assembly as claimed in Claim 1 or 2, wherein the discrete elements are hollow spheres.

4. An assembly as claimed in Claim 3, wherein the passage through the hollow spheres is formed during the creation of the assemblage by a mould subsequently removed.

5. An assembly as claimed in Claim 1 or 2, wherein the discrete elements are expanded beads of plastics material, for example polystyrene.

6. An assembly as claimed in Claim 5, wherein the passage through the expanded beads is created by a pipe

whose wall is apertured by perforations or slits to allow water passing through the expanded beads to flow into the pipe to be conducted away.

7. An assembly as claimed in any one of the preceding Claims, wherein the sleeve and the outer ends of the drainage units are provided with co-operating male and female clip means.

8. An assembly as claimed in any one of the preceding Claims, wherein the longitudinal walls of each drainage unit is covered with a net of fine stocking mesh.

9. An assembly as claimed in any one of the preceding Claims, wherein the cross-section of each drainage unit is of shape to complement the cross-sectional area of a drainage trench into which it is to be laid.

10. A drainage assembly substantially as hereinbefore described with reference to Figs. 1, 2 and 3 of the accompanying drawings.

11. A drainage assembly substantially as hereinbefore described with reference to Figs. 4 and 5 of the accompanying drawings.

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